

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 13966 (1994): Sodium Carboxymethyl Cellulose for Use in Oil Industry [CHD 20: Paints, Varnishes and Related Products]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE



भारतीय मानक

तेल उद्योग में प्रयोग के लिए सोडियम कार्बोक्सिमिथाइल
सेलुलोज — विशिष्ट

Indian Standard

**SODIUM CARBOXYMETHYL CELLULOSE FOR
USE IN OIL INDUSTRY — SPECIFICATION**

UDC 661.728.892.1 : 665

© BIS 1994

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Linters and Allied Products Sectional Committee had been approved by the Chemical Division Council.

Sodium carboxymethyl cellulose is extensively used in the oil-well drilling industry. It is also known as cellulose gum and has a variety of uses in industries, such as paper, detergent, insecticides, textile and oil-well drilling. It is also used in food, medicine and cosmetics industries. This standard, however, covers only requirements of carboxymethyl cellulose for use in oil industry.

Sodium carboxymethyl cellulose is manufactured in several viscosity ranges and is also available in different degrees of substitution and active matter content depending on the end use. Taking this into consideration alongwith the prevalent trade practices and views of the users and manufacturers regarding the types in demand, it was decided to prescribe two types of the material for oil-well drilling industry. It is hoped that these types will meet the present uses of this material satisfactorily.

In preparation of this standard considerable assistance has been drawn from the specification formulated by the Institute of Drilling Technology, ONGC, Dehra Dun, which is thankfully acknowledged.

The composition of the Committee responsible for formulation of this standard is given at Annex C.

For the purpose of deciding whether a particular requirement of this standard, is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*).

Indian Standard

SODIUM CARBOXYMETHYL CELLULOSE FOR USE IN OIL INDUSTRY — SPECIFICATION

1 SCOPE

This standard prescribes requirements and methods of sampling and test for sodium carboxymethyl cellulose for use in oil industry.

2 REFERENCES

The Indian Standards listed below are necessary adjuncts to this standard:

IS No.	Title
460 (Part 1) : 1985	Specification for test sieves : Part 1 Wire cloth test sieves (<i>third revision</i>)
1070 : 1992	Reagent grade water (<i>third revision</i>)
3517 : 1979	Cotton linters (<i>first revision</i>)
3520 : 1992	Water-soluble sodium carboxymethyl cellulose (<i>second revision</i>)
4905 : 1968	Methods for random sampling
6186 : 1986	Bentonite (<i>second revision</i>)
12253 : 1987	Glossary of terms relating to linters and its allied products

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 12253 : 1987 shall apply.

4 TYPES

Sodium carboxymethyl cellulose shall be of the following two types:

Type 1 — High viscosity grade, and

Type 2 — Low viscosity grade.

5 REQUIREMENTS

5.1 Description

The material of both the types shall be white to creamish free flowing powder, free from lumps and foreign matter.

5.2 Moisture Content

The material of both the types shall not contain moisture more than 10 percent by mass when tested in accordance with the method prescribed in Annex A of IS 3517 : 1979.

5.3 Sodium Carboxymethyl Cellulose Content

The material of both the types shall contain a minimum of 55 percent by mass of sodium carboxymethyl cellulose, on dry basis, when determined in accordance with method prescribed in Annex C of IS 3520 : 1992.

5.4 Yield

5.4.1 The yield of a suspension of Type 1 material in distilled water having an apparent viscosity of 15 cP, prepared by stirring for 30 minutes with a laboratory stirrer (5 000 to 6 000 rpm) and ageing for 24 h at $27 \pm 2^\circ\text{C}$, shall be not less than 200 m³/metric tonne.

5.4.2 The yield of a suspension of Type 1 material in salt water (Prepared by dissolving 35 g of sodium chloride in one litre of distilled water) having an apparent viscosity of 15 cP, prepared by stirring for 30 minutes with a laboratory stirrer (5 000 to 6 000 rpm) and ageing for 24 h at $27 \pm 2^\circ\text{C}$ shall be not less than 60 percent of the value obtained in **5.4.1** above.

5.5 Apparent Viscosity

The apparent viscosity of 2 percent (*m/v*) suspension of Type 2 material (as received) in distilled water at $27 \pm 2^\circ\text{C}$ shall be maximum 30 cP when determined in accordance with method prescribed in Annex E of IS 3520 : 1992 using Fann V. G. viscometer.

5.6 Dry Sieve Analysis

No material of Type 2 shall be retained on Indian Standard sieve of mesh size 2.00 mm [*see* IS 460 (Part 1) : 1986].

5.7 Degree of Substitution

When determined in accordance with method prescribed in C-2 of IS 3520 : 1992, the degree of substitution of material of Type 2 shall be minimum 0.70.

6 PERFORMANCE TEST

6.1 The Type 2 material shall pass the performance test as given in Annex A.

7 PACKING AND MARKING

7.1 Packing

The material shall be packed in moisture-proof

high density polyethylene (HDPE) bags or polyethylene lined jute bags.

7.2 Each bag shall be legibly and indelibly marked with the following information:

- a) Name of the material;
- b) Indication of the source of manufacture;
- c) Batch No. ; and

d) Month and year of manufacture.

8 SAMPLING

Representative samples of the material shall be drawn and tested for their conformity with the requirements of this standard in accordance with the method of sampling prescribed in Annex B.

ANNEX A

(Clause 6.1)

METHOD OF TEST FOR PERFORMANCE

A-1 PROCEDURE

A-1.1 Preparation of Fresh Water (Base) Mud

Prepare a suspension of bentonite (*see* IS 6186 : 1986) in distilled water (*see* IS 1070 : 1991) by dissolving maximum 6 g of bentonite per 100 ml of distilled water. Stir the suspension for 15 minutes at high speed in Hamilton Bench Mixer. After stirring the suspension, ensure that no lumps remain in the suspension.

A-1.1.1 Keep the suspension in A-1.1 for hot rolling in ageing cells maintained at $90 \pm 2^\circ\text{C}$ for 72 h in a roller oven. After this period, cool the suspension to $27 \pm 2^\circ\text{C}$. Stir the cooled suspension in Hamilton Bench Mixer for 2 minutes at high speed to make the whole suspension, homogeneous. Divide the suspension, thus obtained, in two equal parts of 500 ml each and transfer them in Hamilton Bench Mixer containers.

A-1.2 Stir one part of the suspension obtained in A-1.1.1 for 30 minutes at $27 \pm 2^\circ\text{C}$ at high speed and determine its apparent viscosity using Fann V. G. viscometer in accordance with the method prescribed in Annex E of IS 3520 : 1992. Also determine the filtration loss at $27 \pm 2^\circ\text{C}$. The apparent viscosity of the material shall not more than 35 cP and the filtration loss shall be not more than 21 ± 1 ml.

A-1.3 To the other part of the suspension obtained in A-1.1.1, add 0.5 g of the material as received per 100 ml of the bentonite suspension, while stirring in Hamilton Bench Mixer at high speed for 30 minutes at $27 \pm 2^\circ\text{C}$. Determine the apparent viscosity of the suspension using Fann V. G. viscometer in

accordance with the method prescribed in Annex E of IS 3520 : 1992. Also determine the filtration loss at $27 \pm 2^\circ\text{C}$. The apparent viscosity shall not be more than 1.5 times of the value obtained in A-1.2. The filtration loss shall not be more than 40 percent of the value obtained in A-1.2.

A-1.4 Salt Water Mud

Prepare a suspension of bentonite (*see* IS 6186 : 1986) by dissolving a maximum 5 g of bentonite per 100 ml of distilled water (*see* IS 1070 : 1992). Stir the suspension for 20 minutes in Hamilton Bench Mixer at high speed. At the end of stirring, ensure that no lumps remain in the suspension. Keep it for hot rolling in ageing cells at $90 \pm 2^\circ\text{C}$ for 72 h in a roller oven. After ageing, cool the suspension to $27 \pm 2^\circ\text{C}$ and stir it in Hamilton Bench Mixer at high speed for 2 minutes.

A-1.4.1 To each 1000 ml of the suspension obtained in A-1.4, add 40 g sodium chloride and 3.5 g of sodium bicarbonate and stir for 15 minutes at $27 \pm 2^\circ\text{C}$ at high speed in Hamilton Bench Mixer. Age it for 24 h at $27 \pm 2^\circ\text{C}$. Divide the suspension into 2 parts of 500 ml each and transfer them in Hamilton Bench Mixer containers. Stir one part of the suspension for 30 minutes at $27 \pm 2^\circ\text{C}$ at high speed and determine the filtration loss at $27 \pm 2^\circ\text{C}$. The filtration loss shall be within 60 ± 5 ml. To the other part, add 1 g of the material as received per 100 ml of the suspension and stir in Hamilton Bench Mixer for 30 minutes at high speed and determine the filtration loss at $27 \pm 2^\circ\text{C}$. The filtration loss shall not exceed 10 ml.

ANNEX B

(Clause 7)

SAMPLING OF CARBOXYMETHYL CELLULOSE, HEAVY VISCOSITY GRADE

B-1 SAMPLING

B-1.1 Lot

All the containers of the same grade and type of material in a single consignment belonging to the same batch of manufacture shall be grouped together to constitute a lot.

B-2 METHOD OF SAMPLING

B-2.1 Each lot shall be sampled separately. The number of bags to be selected from a lot shall depend on the size of the lot and shall be in accordance with Table 1.

B-2.1.1 These bags shall be selected at random from the lot and in order to ensure the randomness of selection, random sampling methods given in IS 4905 : 1968 may be followed.

B-2.2 From each sample selected as per column 1 of Table 1, approximately equal quantity of material shall be taken from top, middle and bottom portion of each bag so as to form a composite sample weighing about 250 g which shall be divided into three test samples, one each for buyer, seller and reference. Each test sample shall be transferred to a glass sample container and sealed air-tight. Label the

Table 1 Number of Containers to be Selected from the Lot

(Clause B-2.1)

SI No.	Number of Bags in the Lot <i>N</i>	Number of Bags to be Selected <i>n</i>
(1)	(2)	(3)
i)	Up to 5	All
ii)	6 to 50	5
iii)	51 to 100	8
iv)	101 to 300	13
v)	301 to 500	20
vi)	501 to 1 000	32
vii)	1 001 and above	50

containers with date of sampling and other particulars of the material and the lot.

B-2.2.1 The test for all the requirements shall be carried out on the composite sample.

B.2.3 Criteria for Conformity

The lot shall be considered to be in conformity with the requirements of this specification if all the tests performed on the composite sample satisfy the corresponding requirements as specified in this standard.

ANNEX C

(Foreword)

COMMITTEE COMPOSITION

Linters and Allied Products Sectional Committee, CHD 028

Chairman

DR S. N. PANDEY

Members

SHRI R. S. AGARWAL
SHRI ABNASH CHANDER (*Alternate*)
SHRI G. AZEEMODDIN
SHRI B. L. NARASIMHACHAR (*Alternate*)
SHRI A.K. CHATTERJI
SHRI O. P. SHARMA (*Alternate*)
DR D. A. DABHOLKAR
SHRI B. L. BANSAL (*Alternate*)
SHRI I. S. DAHIYA

SHRI B. R. KAKKAR (*Alternate*)
SHRI P. K. DASGUPTA
SHRI N. K. PANDEY (*Alternate*)
EXECUTIVE DIRECTOR
SHRI M. K. KHADRISHA (*Alternate*)
SHRI B. A. GOVINDARAJ
SHRI N. C. NANDY (*Alternate*)
DR N. B. JAUHARI
DR A. G. KULKARNI (*Alternate*)
SHRI S. S. JHUNJHUNWALA
SHRI A. K. JHUNJHUNWALA (*Alternate*)
SHRI B. H. MEHTA
SHRI P. B. C. MENON
SHRI T. K. PARAMESWARAN (*Alternate*)
SHRI B. N. MURTHY
SHRI J. K. ARYA (*Alternate*)
SHRI M. N. PATEL
SHRI K. V. DOSHI (*Alternate*)
SHRI P. S. PATEL
MS J. PETERS
REPRESENTATIVE
SHRI K. P. SAVLANI
SHRI M. K. SAVLANI (*Alternate*)
SHRI V. N. SINGH

SHRI A. K. GANGULI (*Alternate*)
SHRI M. M. SHUKLA
SHRI G. V. SIRUR
SHRI O. P. JHUNJHUNWALA (*Alternate*)
SHRI C. V. SUBBA RAO
SHRI P. V. VARADARAJAN
SHRI A. J. SHAIKH (*Alternate*)
SHRI M. VENKATESWARA RAO
SHRI T. MASTAN REDDY (*Alternate*)
SHRI VIJAY KUMAR
SHRI A. K. CHATTERJEE (*Alternate*)
DR R.K. SINGH,
Director (Chem)

Representing

Jute Technological Research Laboratory (ICAR), Calcutta

Markfed Cottonseed Processing Co, Giddarbha
Oil Technological Research Institute, Anantapur
Directorate General of Technical Development, New Delhi
Shriram Institute for Industrial Research, Delhi
Haryana State Co-operative Supply and Marketing Federation Ltd, Chandigarh
Cellulose Products of India Ltd, Ahmedabad
The Mysore Acetate and Chemicals Co Ltd, Mandya (Karnataka)
Senapathy Whiteley Ltd, Ramanagaram
Indian Pulp and Paper Technical Association, Saharanpur
Reliance Cellulose Products Ltd, Secunderabad
Shree Chemicals, Ambarnath
The Travancore Rayons Ltd, Rayonpuram
Kalpana Chemicals Pvt Ltd, Hyderabad
Gujchem Distillers India Ltd, Valsad
Patel Brothers Services and Engineering Pvt Ltd, Bombay
Oil & Natural Gas Commission, Dehra Dun
Indian Paper Mills Association, Calcutta
Sharda Cotton Traders, Bombay
Directorate General Ordnance Factories, Ministry of Defence (DGOF), Calcutta
Indian Paper Makers, Association, Calcutta
All India Cottonseed Crushers Association, Bombay
Indian Institute of Chemical Technology, Hyderabad
Cotton Technological Research Laboratory (ICAR), Bombay
Coromandel Agro Products & Oil Ltd, Chirala (A P)
ICI India Ltd, Calcutta
Director General, BIS (*Ex-officio Member*)

Member Secretary

SHRI P. MUKHOPADHYAY
Joint Director (Chemicals), BIS

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 1986* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has a copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such a review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards Monthly Addition'.

This Indian Standard has been developed from Doc : No. CHD 028 (305)

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 331 01 31, 331 13 75

Telegrams : Manaksanstha
(Common to all Offices)

Regional Offices:

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg
NEW DELHI 110002

Telephones
{ 331 01 31
{ 331 13 75

Eastern : 1/14 C.I.T. Scheme VII M, V.I.P. Road, Maniktola
CALCUTTA 700054

{ 37 84 99, 37 85 61
{ 37 86 26, 37 86 62

Northern : SCO 445-446, Sector 35-C, CHANDIGARH 160036

{ 53 38 43, 53 16 40
{ 53 23 84

Southern : C.I.T. Campus, IV Cross Road, MADRAS 600113

{ 235 02 16, 235 04 42
{ 235 15 19, 235 23 15

Western : Manakalaya, E9 MIDC, Marol, Andheri (East)
BOMBAY 430093

{ 632 92 95, 632 78 58
{ 632 78 91, 632 78 92

Branches : AHMADABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE.
FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR.
LUCKNOW. PATNA. THIRUVANANTHAPURAM.